

**Dennis J. Seal, Ph.D., P.E.**  
**Seal Design & Engineering, Inc.**  
**Human Factors/Systems Safety**  
**6461 Lake Circle Drive**  
**Dallas, Texas 75214**

**Exhibit G**

**Florence A. Murray**  
**Murray & Murray Co.**  
**111 E. Shoreline Dr.**  
**Sandusky, OH. 44870**

**13 November 2023**

**Re: M. Lately vs. Silacal, Inc., et al**  
**In the 224<sup>th</sup> Judicial District Court, Bexar County, Texas**  
**Cause No.: 3:22-cv-1134**

Dear Ms. Murray,

Per the request of your office and as a Professional Engineer (Texas No. 79090) I have been asked to prepare an expert report in the above-referenced case. The primary issues addressed in this report include, but are not limited to, visual perception, hazard detection, and conspicuity factors relative to a driver's Perception and Reaction Time (PRT) within the context of driver expectancy and accident avoidance. My expert opinions also address highway safety issues relative to the interacting variables of human perception, driver behavior, information processing and environmental conditions. All opinions are based on my education and experience in related areas of human factors, driver expectation and published CDL operator safety regulations as well as my review of the following materials made available to me prior to the date of this report:

- (1) Plaintiffs' Original Petition;
- (2) Defendant's Original Answer;
- (3) Copy of Ohio DOT Crash Report Dated 06/27/2020;
- (4) Photographs of accident scene and incident vehicles;
- (5) Bosch CDR report for the 2014 Chrysler 300 (driven by Michael Lately);
- (6) Ohio Commercial Driver License Manual (July, 2017);
- (7) Scene inspection and drive-through conducted on October 10, 2023;
- (8) Published Dissertation, "Comfortable Driving Speed Evaluated," 1980;
- (9) "Human Factors in Traffic Safety," (Second Edition), Robert Dewar and Paul Olson (2007);
- (10) "Driver Perception and Response," (Third Edition) Library of Congress Cataloging, Paul Olson, Robert Dewar and Eugene Farber (2010);
- (11) Review of literature including transportation standards and peer reviewed publications relative to Driver Safety and Conspicuity Factors, Stopping Distance and Decision Sight Distance.

I have been requested to investigate the issues of this case and specifically address human factors elements as these areas of my expertise relate to driver behavior and highway safety including the visual based properties of perception, detection, and reaction times. These areas are particularly relevant in this case as relating to the visual detection of highway traffic, a driver's decision-making processes and safe maneuvering responses when confronting unexpected roadway conditions. I have reviewed accident scene photographs, as well as investigating officer's detailed narrative and peer-approved scientific literature. I have also conducted a site inspection and drive-through on October 10, 2023. A copy of my curriculum vita is attached for a complete review of my qualifications. I am being compensated for my expert services on an hourly basis of \$385.00 per hour.

This report is based on the discovery materials listed above as well as my highway transportation experience working as an engineer with the Texas Transportation Institute (TTI) at Texas A&M University (College Station, Texas). As a Human Factors Engineer working in the area of highway safety, I have conducted studies to determine driver response times to target stimuli including the study of cognitive processing and reaction times relative to roadway design, vehicle positions and traffic volume. Variables such as vehicle speeds, environmental conditions, highway design and driver expectancies as well as conspicuity factors were evaluated in relation to visual detection and response times including evasive type maneuvers. The primary purpose of these Government funded programs was to ascertain the most critical elements of visual processing in efforts to improve roadway safety and subsequently document as regulatory criteria in the publications of the Texas' Manual of Uniform Traffic Control Devices (TXMUTCD). Throughout my career, I have continued to use experimental research methods and quantifiable measurements as well as reliance on scientific publications and regulatory standards for applied design criteria and risk mitigation applications.

One of the important findings in transportation studies, and most relevant to this case, was that certain conditions of highway configurations including the visual environment, driver expectations and speed variance were critical factors in allowing drivers: (1) to perceive target stimuli for recognition purpose, (2) comprehend critical information and establish situational awareness, and (3) react appropriately and safely within the necessary time/distance parameters for a safe driving task. Conversely, if certain conditions were less than threshold values (e.g., for an evasive type of maneuver) or driver expectations were violated, the probability of an incident occurrence was increased in both probability level and severity of consequence. This is most critical when addressing the disparity of speeds of the lead and approaching vehicle during nighttime conditions.

I have used the same peer accepted methodology for all visual studies during my 40-year career to determine optimal stimulus characteristics for traffic and environmental signage, displayed warnings, as well as for visual displays in aircraft cockpits, heavy machinery and specialized mission workstations. The ultimate objective has been to enhance the recognition process, maximize situational awareness and increase the probability of an appropriate response for purposes of safe driver, pilot, mission crew members and other operations of transportation and special mission assignments.

### **ACCIDENT DESCRIPTION**

Based on my review of the above-referenced materials, including the investigative officer's report and discovery documents, it is my understanding that in the evening hours prior to the reported crash time of 23:41 hours, on June 27, 2020, Patrick Ferrell had pulled off the highway to "relieve himself" in a construction zoned area of Interstate 80 (I-80) in Sandusky, Ohio. Traffic lanes along this area of the highway were reduced from three lanes to two lanes of travel.

While parked between construction barrels, Patrick Ferrell did not provide approaching traffic any warnings of his stationary position by means of flashing hazards or warning triangles per 49 CFR 392.22 (Federal Motor Carrier Safety Regulations). During my site inspection conducted on October 10, 2023, I noted there was an Ohio Turnpike service plaza approximately 4.0 miles prior to where Mr. Ferrell parked and where he could have safely pulled off the highway to take a comfort break, without endangering himself or the driving public along this stretch of highway.

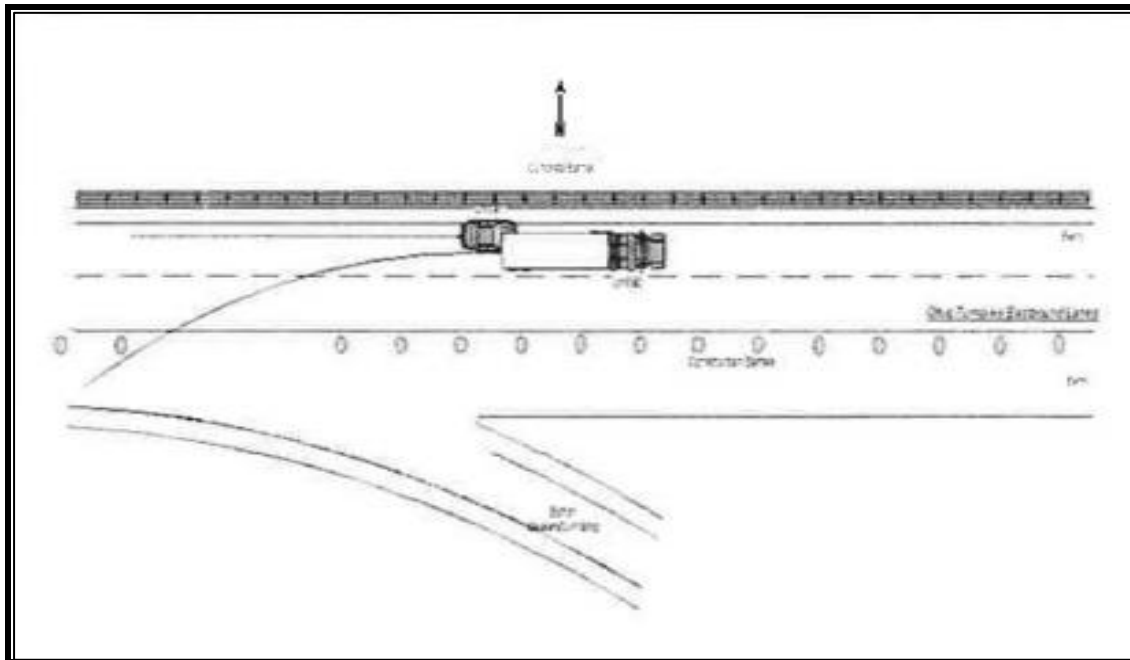
Ohio Administrative Codes Sections 5537-2-14 and -15 prohibit the driver of a vehicle from stopping and parking whether attended or unattended, except in the case of an emergency or when so directed by a police officer. Once Patrick Ferrell was back in his tractor-trailer, he pulled off the emergency recovery lane at a slow rate of speed, "not even 15 mph" (Re: Patrick Ferrell's written statement), onto the outside land forcing Michael Lately to steer onto the inside lane of travel. As Mr. Lately was taking evasive action and changing lanes, Patrick Ferrell continued to drive at a slow rate of speed crossing over into the left lane, and into the path driven by Mr. Lately, resulting in the reported collision to the rear of Ferrell's trailer.

Conditions reported in the crash report were wet roadway due to moderate rain fall, and night-time conditions prevailed at the time of the reported collision. The Investigator's Narrative of the incident as reported in the Texas Peace Officer's Report, dated June 27, 2020, is given below (Figure 1), followed by the incident diagram depicted by the investigating officer (Figure 2).

#### **NARRATIVE**

UNIT #1 and Unit #2 were both traveling eastbound on I-80. Unit #2 was established in the left lane after merging into the lanes of travel. Unit #1 approached and struck the trailer of Unit #2.

**Figure 1: Investigating Officer's Narrative**



**Figure 2: Investigating Officer's Field Diagram**

## **HUMAN FACTORS AND TRAFFIC SAFETY**

The transportation safety literature consistently reports that highway accidents cannot be explained by a single isolated event. As complex as human cognitive and sensory functions may be, traffic accidents are best examined in terms of sequential factors involving the driver and vehicle as well as the roadway and environmental factors. Human factors elements are based on the traditional stimulus-response model which has been methodically tested, peer accepted and frequently documented in scientific journals.

The driver of a vehicle must be viewed as a visual sensing system with innate limitations and operator expectations. A driver may perceive an unexpected roadway condition and must produce an appropriate response in a given amount of time and distance in order to avoid an accident and potentially fatal consequences. Drivers caught by surprise are less able to avoid a collision. The time required to elicit a response is known as the driver's perception-response time (PRT) and is broken down into four stages: object detection, identification, decision process, and driver response (Olson & Farber, 2010). During the detection stage, the driver initially perceives "something noticeable" in the environment. This involves seeing some object in their path of travel or peripherally in the distance. Once the object is detected the driver must determine if the object represents a hazard. Next, the driver must decide what action to take, if any. If the driver perceives the object as a hazard and in the path of travel, some action to avoid the hazard must be taken (e.g., evasive braking, swerving), but only if traffic volume and roadway design permits maneuvering. After the decision has been made to respond evasively, the driver must initiate and carry out that action (e.g., deceleration, turning maneuver). While it is difficult to calculate precisely the temporal duration of each stage, based on decades of transportation research it is possible to estimate PRTs for various accident scenarios.

The stages of the PRT cycle rely on interactive elements of visual, cognitive and motor processes and though some of these actions seem virtually automatic, each stage can become very demanding under certain traffic conditions and interfere with normal expectancies of the driving task. While it is not possible (following an accident) to assign a single value for a person's PRT, the scientific literature on the topic does provide insight to make reasonable and scientifically reliable estimates for these values. Under normal daytime driving situations and assuming "a predictable situation and minimal time available for a response," most operators will respond within approximately 1.5 seconds to an "identifiable hazard" that appears directly in front of the driver (Olson & Farber, 2010).

Some of the conditions that potentially increase a driver's PRT include competing stimuli, violation of driver expectancy, traffic volume, weather, and roadway layout. As a result, the actual range of PRT is 1.5 to 5.0 seconds as substantiated in the highway research literature (Olson, Dewar and Farber, "Driver Perception and Response, 3<sup>rd</sup>. Edition, 2010).

### **PERCEPTION OF CLOSING SPEED AND DRIVER EXPECTATIONS**

A critical yet difficult skill for drivers is the assessment of closing speed. It is used in judging the distance of gaps in traffic for such basic maneuvers as changing lanes, merging and safely passing. The fact that drivers generally perform these maneuvers successively suggests that they can make these judgments with some accuracy. In fact, the judgment of closing speed is something that available research indicates that humans do very poorly. Drivers succeed in situations that seem to call for this skill only because they have "learned" (through repeated trials) that a gap is adequate when the approaching vehicle appears (based on visual angle) to be at least a certain distance away. If a forward vehicle's speed is greatly 'different' from other traffic (i.e., greater than 10 mph) then the potential for a vehicle collision exists since humans cannot discern closing speed with any accuracy until the gap has closed to a dangerous extent. Often times this gap will close to a point where human reaction time will not allow the required evasive action on the part of the vehicle following as it approaches another vehicle. The problem lies in the cues (e.g., size, luminance and contrast) that are used in judging closing speed.

Of course, there is nothing unusual about closing on another vehicle while driving. What is unusual is closing the gap at a differential rate of speed (i.e., greater than  $\Delta V$  of 10 mph) relative to the forward vehicle's speed. There exists a potential problem with perceptual limitation. Furthermore, a driver's expectations are violated when he/she encounters a vehicle that is moving much slower than typical traffic would normally be driving. As described in the above paragraphs, Patrick Ferrell had parked on the emergency recovery lane and slowly transitioned back onto the interstate at a very slow rate of speed into traffic driving at highway speeds. The actions of Defendant Ferrell resulted in a perilous closing velocity of highway speeds (Posted Speed: 55 mph) that the transportation literature attributes to a high probability of accident occurrence associated with a high severity level of injury and death. In fact, the literature has shown that an excessive closing velocity and a high variance of speeds is highly correlated with the severity of a crash, for both property damage and severity of personal injury.

Indeed, when the driver's expectancies are violated (due to a high rate of closing speeds) the probability that a situation (i.e., approaching a vehicle) will be correctly identified is significantly reduced and the time required to react (i.e., evasively) is significantly increased. The overall ability of a driver to judge the speed of another vehicle, whether traveling in the same or opposite direction, is limited even under controlled test conditions. (D. Seal Dissertation, 1980) The time required for this "correction of expectancies" increases the total time needed to respond (i.e., the PRT interval) and the total response time to evasively maneuver the vehicle either by deceleration, changing lanes, or by stopping the vehicle. As a result, the probability of an "incident occurrence" was significantly increased.

In my expert opinion, Michael Lately had detected and identified a "potential" hazard crossing his lane of travel. It is more likely than not, Lately was in the decision-making stage of the PRT model when the impact occurred. Due to the unexpected event of a slow-moving vehicle crossing his lane as well as the inconspicuous elements of the angled tractor-trailer relative to his closing vehicle, Lately had not fully realized the presence of the tanker-tractor in time to initiate and complete his evasive actions necessary to avoid impact. Due to the tractor-trailers' slow rate of acceleration as Ferrell drove away from his parked location and then continued across the outside lane onto the inside lane of traffic, the closure rate of Mr. Lately while approaching Defendant Ferrell's tractor-trailer exceeded a driver's ability to perceive, identify and respond safely while performing an evasive maneuver.

Driver expectations, perception and reaction, vehicle dynamics, and the visual environment all contribute to one's ability to perform evasive maneuvering. The critical stopping distance is defined as the distance a vehicle travels during the driver's PRT phases plus the distance required to decelerate the vehicle to a complete stop (i.e., braking distance). Braking distance is a function of vehicle dynamics (e.g., the vehicle's speed, tire friction/pavement condition). This metric is a tool commonly employed by human-factors scientists as well as traffic engineers to evaluate driver behavior and responses in emergency situations. Specifically, estimating critical stopping distance provides insight for addressing the question: Could a reasonable driver have avoided this accident, given the circumstantial driver behavior, vehicular speeds, and weather conditions at the time?

Applying the critical stopping distance model to this case underscores the pertinent variables confronting Mr. Lately as he was driving eastbound bound on I-80. Based on the literature reported in "Driver Perception and Response" it is reasonable to apply a minimum of 2.2 seconds detection and recognition value given the sequence of unexpected events confronting Mr. Lately consider nighttime



driving conditions and raining weather while driving through an Interstate construction zone. At a certain point in the PRT equation a level of situational awareness was reached (i.e., just noticeable difference) and the decision to perform an evasive maneuver was initiated as Lately decelerated, braked and steered as best he could in a limited amount of time, before impact with the trailer.

Occurring simultaneously with his initial detection of the tractor-trailer was Lately's "mental processing" activity that included, (1) visual searching for other vehicles that may be traveling behind him in eastbound lanes; (2) the decision-making process whether to continue straight or turn to the open lane; and (3) the realization the tractor-trailer was crossing both lanes. The complexity of these decisions, including the "mental processing" of alternative risk mitigation actions, the possibility of other traffic and the confusion caused by the tractor-trailer crossing the highway resulted in a minimal duration of 2.2 seconds of pre-maneuver visual activity and recognition, and initial decision processing before physically maneuvering his vehicle. This mentally complex and challenging period of physical maneuvering required extraordinary actions, on the part of Lately, while multi-tasking and maintaining control of his vehicle. Unfortunately, the critical stages of PRT, i.e., decision process and reaction, were increased due to the unsafe and unexpected driving actions of Defendant Patrick Ferrell as he drove across both the outside lane and then towards the inside lane of eastbound traffic under night time, raining conditions, through a construction zone.

### **SUMMARY of OPINIONS**

Accident history shows that when drivers, such as Michael Lately are confronted with unexpected driving conditions that initial response times are increased, decision processes longer and overall maneuvering and stopping distances lengthened. Complicating the expectancy model and increasing Lately's response times, decision-processing duration and maneuvering distance was the fact that Lately's field of view was more likely than not directed towards an angular position of the tractor-trailer, i.e., not directly towards the rear, as Ferrell's rig was moving across both lanes after parking on the shoulder of the construction area.

As stated earlier in this report, traffic accidents are the result of a series of events and cannot be explained by one single isolated action. In this particular matter, and based on the crash report, written statements of Defendant Ferrell and investigative reports, the following elements of the subject collision explain the events of this unfortunate collision:



- 1) In my expert opinion, as well as that of the investigating officers, Michael Lately immediately performed evasive maneuvers once he visually determined the tractor-trailer was crossing his lane of travel.
- 2) In my expert opinion, Michael Lately's period of looming was extended as he initially processed the confusing visual elements of the tractor-trailer moving slowly across the highway as he realized a "potential" hazard was crossing into his lane of travel. It is more likely than not Mr. Lately was in the decision-making stage of the PRT model when the impact occurred. Due to the unexpected event of the tractor-trailer crossing both lanes of travel, Lately had not fully realized the presence of the tractor-trailer in time to initiate, perform and complete his evasive actions necessary to avoid impact.
- 3) Defendant Patrick Ferrell stated he saw lights in his rearview mirrors yet failed to yield the right-of-way to Michael Lately while pulling out and crossing both eastbound lanes, while driving approximately 35 mph below the speed limit. This delta-V created by Ferrell's slower speed resulted in a violation of driver expectancy and a perilous rate of closure for approaching eastbound traffic. In my expert opinion, it is more likely than not Defendant Ferrell did not look to his left for oncoming traffic before pulling out from the shoulder.
- 4) Defendant Ferrell egregiously violated safety rules of CDL drivers by neglecting to stop sooner at the Turnpike service station, instead endangering the driving public as he parked between construction barrels without the use of hazards or warning triangles and slowly pulled onto the highway into active lanes of traffic.
- 5) Defendant Patrick Ferrell violated the following sections of the Ohio Administrative Codes:
  - a. **Ohio Administrative Code 5537-2-14** – Operating on Shoulders, stating "No person shall operate a motor vehicle on the shoulders except in the case of an emergency or when so directed by a police officer."
  - b. **Ohio Administrative Code 5537-2-15** – Stopping, parking, or standing of vehicles, stating "No person shall stop, park, or leave standing any vehicle, whether attended or unattended, upon the traffic lanes, acceleration lanes, deceleration lanes, bridges, entrance or exit ramps, shoulders, provided that in case of an emergency, a motor vehicle may be stopped and parked on the shoulder adjacent to the outer traffic."
- 6) Based on both Federal and Ohio Commercial Driver requirements, and relative to Defendant Ferrell's violations of the same, it is my expert opinion that Silacal, Inc. did not adequately train Mr. Ferrell in the above areas of driver safety. Specifically, Defendant Ferrell violated safety regulations as he pulled over and stopped on an emergency shoulder for a non-emergency event, and returned to the highway at a slow rate of speed into the eastbound traffic lane without remaining vigilant of oncoming traffic.

- 7) If Ferrell had not parked on the emergency shoulder of the construction area, but had pulled over at the nearby service station, Defendant Ferrell would have been able to enter the highway at an appropriate rate of speed, i.e., approximately 50 mph, significantly reducing both the likelihood and severity of an accident, as occurred on the evening of June 27, 2023.

In conclusion of my investigation and based on peer-accepted engineering practices as well as my education and experience in the area of human factors, transportation safety, perception and reaction times, it is my expert opinion that the reported collision and resulting injuries were the result of Defendant Patrick Ferrell's violation of safety regulations and failure to yield the right-of-way to Michael Lately. The unsafe chain of events constituted a complete disregard of highway safety and created an extreme disparity of vehicle speeds during night time conditions as Defendant Ferrell pulled into Mr. Lately's lane of traffic. A serious violation of driver expectancy resulted from Mr. Ferrell's unsafe driver actions while Mr. Lately reacted in a reasonably prudent manner as he decelerated, and turned evasively while attempting to maneuver his vehicle out of harm's way.

The opinions expressed in this report as well as concluding statements are based on the materials available as outlined earlier in this report. Since discovery is ongoing and more materials may be produced, I reserve the right to re-examine and alter these opinions as new or additional information becomes available.

Sincerely Yours,



Dennis J. Seal, Ph.D., P.E.  
Human Factors/Systems Safety  
Seal Design & Engineering, Inc.



**Dennis J. Seal, Ph.D., P.E.**  
**Seal Design and Engineering, Inc.**  
**6461 Lake Circle Drive**  
**Dallas, Texas 75214**  
**Office: 214 823-9364**  
**Cell: 214-734-3708**  
**djseal@sbcglobal.net**

**EDUCATION:**

- Ph.D.,** Industrial Engineering/Human Factors and Product Safety  
Texas A&M University, College Station, Texas, 1980
- M.S.,** Experimental Psychology/Information Processing, Learning,  
Statistics and Test Methodologies  
Texas A&M University, College Station, Texas, 1974
- B.A.,** Psychology/Statistics, University of Cincinnati, Cincinnati, Ohio, 1972  
Awarded Academic and Athletic Scholarships

**PROFESSIONAL EXPERIENCE:**

**L3 Harris Corporation (Retired: October 2020)** 1985 – 2020  
Aerospace Systems, Plano, Texas  
(Formerly Raytheon Systems, Chrysler Technologies and Electrospace Systems)  
New York, N.Y. (Headquarters)  
**Principal Systems Engineer: Human Factors and Product Safety**

- Director of Human Factors and Safety Engineering for all Corporate Programs
- Conduct research and qualification tests to support program efforts in product development and subsystem design and integration.
- Apply Human Factors and Safety criteria in the design of visual displays and controls, workstation layouts, aviation systems, hazard identification and risk mitigation, warnings and alerting devices, technical user manuals, and operator/maintainer operations.
- Establish program plans, test procedures, and analyze test data and report results in technical documentation and/or at scheduled Design Reviews (e.g., PDR, CDR, TIMs).
- Prepare/manage budget and technical documentation for contract proposals.
- Establish/maintain Corporate Hazard Communication Programs (OSHA 1910) for employee training in safety and health, including workstation evaluations, facility safety, HAZCOM initiatives, safety warnings and training.
- Integrate human engineering and safety criteria with mechanical and electrical engineers, software programmers, environmental test, quality control, and manufacturing departments during each scheduled design stage.

**TEXAS INSTRUMENTS, INC., Dallas, Texas** 1983 – 1985  
**Director, Human Factors/Ergonomics – Consumer Products**

- Managed Human Factors Department for new product design, personnel staffing, administration and budget, product development activities, and test laboratory.
- Organized sample populations, methodology and research efforts for prototyped product tests (e.g., keyboards, joystick controls, gaming products), analyzed results, and articulated product design recommendations to the design staff.
- Establish Corporate Human Factors design criteria for U.S. and Japan Product Centers.
- Integrated Human Factors design criteria with Industrial Design, Graphics, Software, Marketing, Packaging, and Manufacturing staffs.

**Dr. Dennis J. Seal**

**page 2**

HENRY DREYFUSS ASSOCIATES, New York, New York 1979 – 1983  
**Manager of Human Factors Development – Industrial Design/Consumer Products**

- Project activities included implementing human factors and safety requirements for consumer product designs. Also conduct research and pilot studies, as well as evaluate scaled mock-ups and prototypes in support of new product development.
- Worked closely with clients (e.g., AT&T, Bell Laboratories, Falcon Jet, John Deere and Company, CITICORP, LearJet, Polaroid, and American Airlines) during all phases of product design to ensure human factors, safety and ergonomic requirements were implemented in final production.
- Served as a committee member of original American National Standards Institute (ANSI Z535) for the purpose of establishing industry standards based on human perception, detection, and comprehension of displayed information for warnings, symbols, and visual displays. Standards were adopted in 1991 for industry-wide use on commercial, industrial and Government issued products.

SOUTHERN METHODIST UNIVERSITY, Dallas Texas 1985 – 1986  
**Adjunct Professor, Human Factors and Industrial Ergonomics  
Operations Research and Engineering Management Department**  
Taught Human Factors/Product Safety courses to undergraduate and graduate level students.

TEXAS A&M UNIVERSITY, College Station, Texas 1977 – 1979  
**Visiting Instructor and Teaching Assistant, Department of Psychology**  
Taught courses in Introductory, Industrial and Developmental Psychology to undergraduate and graduate level students.

DEPARTMENT OF TRANSPORTATION, Austin, Texas 1977 - 1979  
**Project Coordinator; Governor's Office of Traffic Safety**

- Program Manager for D.O.T. funded project evaluating interactive effects of vehicular design, vibration/noise levels, highway design, perceived rates of speed, and comfortable driving speeds. (Re: D. J. Seal, Ph.D. "Comfortable Driving Speed Evaluated," Published Dissertation)
- Responsibilities included proposal preparation, contract and budget coordination, supervising research assistants, data analysis, organizing progress reports, and presenting the findings to the Texas Department of Traffic Safety.

TEXAS TRANSPORTATION INSTITUTE, College Station, Texas 1975- 1977  
**Research Assistant, Texas A&M University**

- Conducted studies to aid in the design and implementation of real-time information displays and warnings that were used on urban freeways and parallel alternative routes.
- Display designs were based on information processing theory, visual recognition, conspicuity and reaction times of drivers during simulated highway driving maneuvers.
- Results of study were the basis of the published standards, "Texas Manual on Uniform Traffic Control Devices (for streets and highway application)."

**Dr. Dennis J. Seal**

**page 3**

**CORPORATE RESPONSIBILITIES:**

Director of Human Factors/Ergonomics and Product Safety engineering for corporate engineering. Engineering programs include systems design, product development and qualification tests, subsystem components, product designs and integrations, facility safety, aircraft modifications, hazard analysis and risk resolution.

As human factors and safety engineer responsibilities have included compliance to OSHA HAZCOM, Environmental Protection Agency (EPA), National Institute of Occupational Safety and Health (NIOSH), American Disabilities Act (ADA), and American National Standards Institute (ANSI).

Also responsible for site surveys, product and systems evaluation, hazard identification, safety warnings (per ANSI Z535), and hazard resolution applications at all engineering, production and manufacturing phases.

Primary functions on engineering programs include workstation environments and component interface designs, anthropometric/operator studies/visibility, lighting and acoustic measurements, operator tasks and behavioral analyses, warnings, user manuals and training, design of controls and visual displays, hazard analysis and safety reviews, mock-ups and prototype evaluations, ergonomic analyses, software applications, and final system integration and qualification tests.

Since retiring from Corporate Engineering positions in October, 2020 I have consulted in the above-reference areas for either product design, safety compliance, warnings analysis and design, facility safety, visual properties and reaction times, engineering standards and accepted practices. I continue to consult and testify in related areas of engineering for both plaintiffs and defendants in litigated matters.

**AREAS OF INTEREST:**

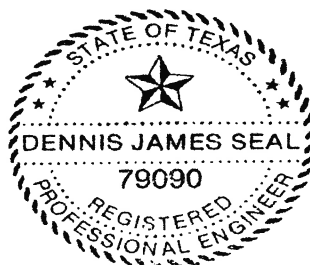
Product functionality and safety, product testing and qualification, mission-control environments; information processing theory and learning; hazard identification/resolution; warnings/signs and labels; quantitative methods; human factors in aviation; accident investigation and transportation safety.

**PROFESSIONAL MEMEBERSHIPS:**

Registered Professional Engineer, State of Texas (P.E. 79090)  
Registered Professional Engineer, State of Wyoming (P.E. 15888)  
NCEES – Registered P.E.  
Human Factors and Ergonomics Society-Member Emeritus  
Ergonomics/Occupational Safety and Health  
American National Standards Institute (ANSI)  
Consumer Product Safety Commission (CSPC)  
Electronic Industries Association (EIA G-45 and SAE)  
Private Pilot (Current) - Aircraft Owners and Pilots Association (AOPA)

**SECURITY CLEARANCES:**

TOP SECRET (Active)  
COMSEC (Active)





**Dennis J. Seal, Ph.D., P.E.**  
**Seal Design & Engineering, Inc.**  
**Principal, Human Factors and Product Safety**  
**Design and Engineering Consultation**  
**6461 Lake Circle Drive**  
**Dallas, Texas 75214, USA**  
**(214) 823-9364 (Dallas Office)**  
**214-734-3708 (Cell)**  
**Fax (214) 823-9372**  
[djseal@sbcglobal.net](mailto:djseal@sbcglobal.net)

**Specialties:** Accident Analysis, Anthropometry (body measurement and accessibility), Controls/Display Panel Design, Conspicuity/Human Reaction Times, Hazard Analysis, Heavy Machinery, Human Performance/Fatigue, Industrial Ergonomics, Back-Up Warning Devices, OSHA Compliance, Perception/Reaction Time (PRT Analysis), Product Design and Safety, Visibility Standards, Warnings/Guards/Safety Instructions, Workstation Design

**Additional Expertise:** Automotive/Aviation Safety, Cognitive Modeling/Information Processing, Industrial Safety, Usability Testing, Visual Displays and Control Interfaces, Workplace Hazards and Personal Protective Equipment (PPE)

**Educational:** Ph.D. Human Factors and Safety Engineering (Industrial Engineering Department), 1980, Texas A&M University,  
M.S. Experimental Psychology, 1974, Texas A&M University,  
B.A. Psychology and Statistics, 1972, University of Cincinnati

**Supplemental:** Registered Professional Engineer (No. 79090), State of Texas  
Registered Professional Engineer (No. 15888), State of Wyoming  
NCEES – Registered P.E.  
American National Standards Institute (ANSI Z535) Warnings Committee Member  
G-45 Human Systems Integration (HSI) Standards Committee Member  
Private Pilot (Current License and Medical)  
Security Clearances: TOP SECRET, COMSEC (Current)

**Consulting:** Consulting experience spans all aspects of human factors engineering including product design, safety compliance, hazard risk analysis and industrial ergonomics. Past projects include human factors design and safety analysis for the following sample client list: American Airlines, AT&T, Beretta Firearms, Clark and Eaton-Material Handling, Chrysler Technology, Citicorp/Citibank, John Deere and Company, Falcon Jet, Havalon Knives, Freightliner Trucking, General Electric, Johnson & Johnson, Lear Jet, NASA, Raytheon Corp. and SAMSUNG Telecommunications as well as many Government and Military agencies. Consulting in areas of product design and systems integration have included all phases of development from product concept and human factors criteria to job safety analysis, hazard identification/resolution, industrial design, design modifications, operator/personal safety, qualification testing and manufacturing processes. Have also consulted and given testimony as an expert witness equally representing both plaintiffs and defendants in each of the aforementioned areas of expertise.

**Dennis J. Seal, Ph.D., P.E.  
Seal Design & Engineering, Inc.  
Human Factors/Product Safety  
6461 Lake Circle Drive  
Dallas, Texas**

**Re: Rule 26-Testimony List for Dr. Dennis J. Seal (Texas P.E. 79090)  
Years 2019-2023**

- 2019 G. Quinones vs. Regio Express Inc., et al  
Case No: C-1720-17-F  
Plaintiff-Deposition (February 11, 2019)  
Watts Guerra LLP (San Antonio, Texas)
- 2019 R. Lewis v. 3M Company, et al  
Case No: 18-2-09747-4  
Defendant-Deposition (February 15, 2019)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
- 2019 R. Lopez, et al vs 3M Company, et al  
Case No: 2017-DCL-05805  
Defendant-Deposition (February 22, 2019)  
Gerald Alcazar; Blackwell Burke, P.A. (Minneapolis, Minnesota)
- 2019 C. Burke/D. Slone, et al vs 3M Company, et al  
Case No:  
Defendant-Deposition (April 11, 2019)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
- 2019 L. Leggett v. PAM Transports, Inc.  
Case No: 5:18-CV-00040  
Plaintiff-Deposition (April 12, 2019)  
Watts Guerra LLP (San Antonio, Texas)
- 2019 J. Crawford vs J.B. Hunt  
Case No: 01-17-0001-1386  
Houston, Texas  
Defendant-Deposition (May 22, 2019)  
Michael Wright (Russell & Wright, Dallas, Texas)
- 2019 A. Agrios vs 3M Company, et al  
Case No: BC715172  
Defendant-Deposition (June 7, 2019)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
- 2019 W. Frabotta vs. Nakkula/Waati  
Case No: 17-775-NO  
Marquette, Michigan  
Defendant-Deposition (July 29, 2019)  
Joseph McGill (Foley, Baron, Metzger & Juip, PLLC, Livonia, MI.



- 2019 P. Colon vs. John Christener Trucking, Inc. et al  
Cause No. 2018C103948  
Plaintiff-Deposition (August 30, 2019)  
Watts Guerra LLP (San Antonio, Texas)
  
- 2019 R. Larson vs 3M Company, et al  
Case No: 18-2-03806-5 SEA  
Defendant-Deposition (September, 2019)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
  
- 2019 W. Wright vs 3M Company, et al  
Case No: 18-2-02204-5 SEA  
Defendant-Deposition (September 06, 2019)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
  
- 2019 Leonard Rogers vs. GRACO, Inc., et al  
Cause No.: 70CV-15-225-6  
Defendant-Trial Testimony (September 13, 2019)  
Shawn Raiter; Larson King (St. Paul, Minnesota)
  
- 2020 Alfred Burton vs. 3M Company, et al  
Cause No.: 19-2-17070-1 KNT  
Defendant-Deposition (January 27, 2020)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
  
- 2020 C. Armendarez vs. Hyundai Heavy Industries, LTD, et al  
Cause No.: D-1-101-CV-2017-03238  
Plaintiff-Deposition (June 22, 2020); Trial (October 13, 2020)  
Robert Collins; Robert Collins Law (Houston, Tx)
  
- 2020 O. Fuentes, et al vs. Delgado Construction, et al  
Cause No. 18-027-D  
Plaintiff-Deposition (March 30, 2020)  
Mark Fassold; Watts Guerra Law (San Antonio, TX)
  
- 2020 M.R. Bush, et al vs. J. Armstrong, et al  
Cause No.: 2018C116581  
Plaintiff-Deposition (July 24, 2020);  
Mark Fassold; Watts Guerra Law (San Antonio, Tx)
  
- 2020 L. Roemmich vs. 3M Company, et al  
Cause No.: 20-00926-1 KNT  
Defendant-Deposition (August 7, 2020)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
  
- 2020 N. Butler vs. 3M Company, et al  
Cause No.: 2019-12696  
Defendant-Deposition (September 28, 2020)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)

- 2020 S. K. DiPretore, et al vs. Ozark Motors, Inc  
Cause No. 2018-PR02905-2-A  
Plaintiff-Deposition (November 24, 2020);  
Robert Collins; Robert Collins Law (Houston, Tx)
- 2020 I. LaFrentz vs. 3M Company, et al  
Cause No.: 4:18-cv-04229  
Defendant-Deposition (December 8, 2020)  
Kevin Brown; Thompson, Coe, et al (Dallas, Tx)
- 2021 M.R. Bush, et al vs. J. Armstrong, et al  
Cause No.: 2018C116581  
Plaintiff-Deposition (February 19, 2021);  
Mark Fassold; Watts Guerra Law (San Antonio, Tx)
- 2021 J. Moore, et al vs 3M Company, et al  
Case No: 6:19-CV-00038-H  
Defendant-Deposition (March 5, 2021)  
Gerald Alcazar; Blackwell Burke, P.A. (Minneapolis, Minnesota)
- 2021 I. Levin vs Johnson & Johnson, Inc.  
Civil Action No.: 2:16-cv-06631-JFB-AYS  
Defendant – Deposition (April 14, 2021)  
Michelle Bufano; Patterson, Belknap, Webb & Tyler LLP (New York, New York)
- 2021 R. Zirlott, et al vs. Discount Ramps, LLC, et al  
Cause No.: CV-19-900917  
Plaintiff-Deposition (May 19, 2021)  
Tobias, McCormick, Comer, LLC (Mobile, AL)
- 2021 B. Chapman, et al vs. 3M Company, et al  
Civil Action: 17-CI-00437  
Defendant-Deposition (July 29, 2021)  
Byron Miller; Thompson, Miller & Simpson PLC (Louisville, Ky)
- 2021 M. Fox vs. Home Depot, GRACO Inc, et al  
Case No. 8:20-CV-02127  
Defendant-Deposition ( December 3, 2021)  
Shawn Raiter; Larson-King, LLP (St. Paul, Minnesota)
- 2022 M. North vs. Amazon Services LLC  
Case No.: 01-20-0016-0228  
Defendant-Deposition (January 13, 2022)  
Sydnie Shimkus: Bell Nunnally & Martin LLP (Dallas, Texas)
- 2022 A. Hunt vs J. Figueroa and Boggus Motor Sales, LLC  
Cause No.: C-2925-20-D  
Plaintiff-Deposition (January 27, 2022)  
Mark Fassold: Watts Guerra, LLP (San Antonio, Texas)

- 2022 M. North vs. Amazon Services LLC  
Case No.: 01-20-0016-0228  
Defendant-Arbitration (February 4, 2022)  
Sydnie Shimkus: Bell Nunnally & Martin LLP (Dallas, Texas)
- 2022 T. Chaze vs. East Jefferson Parish Levee District, et al  
Case No.: 803-930 Division "J"  
Plaintiff-Deposition (February 11, 2022)  
Michael S. Finkelstein: Sternberg, Naccari & White, LLC
- 2022 J. Nichols vs. 3M Company, et al  
Cause No.: 20-2-15331-1  
Defendant-Deposition (February 21, 2022)  
Kevin Brown: Thompson Coe (Dallas, Texas)
- 2022 O. Fuentes, et al vs. Delgado Construction, et al  
Cause No. 18-027-D  
Plaintiff-Trial (May 19, 2022)  
Mark Fassold; Watts Guerra Law (San Antonio, TX)
- 2022 A. Rayos vs. M. J. Cedeno Del Sol, et al  
Cause No. 19-10-23221-CVR  
Plaintiff-Deposition (August 19, 2022)  
Mary Golder; Webb, Stokes & Sparks, LLP (San Angelo, Texas)
- 2022 Robert Ford vs. Summit Industrial Supply, LLC and Budder Pros  
Cause No. D-202-CV-2020-04539  
Defendant-Deposition (September 14, 2022)  
Matthew Armijo; (Santa Fe, New Mexico)
- 2022 J. Baker, et al vs. Swift Leasing, LLC, et al  
Cause No. 298-373-C  
Plaintiff-Trial Testimony (October 18, 2022)  
Martin Futrell; Witherite Law Group (Dallas, TX)
- 2022 State of West Virginia vs. 3M, et al  
Civil Action No. 03-C-109  
Defendant-Deposition Testimony (October 19, 2022)  
Angela Beranek Brandt (Larson King, LLP, Thompson Coe, Dallas, TX)
- 2022 M. Coleman, et al vs. 3M Company, et al  
Civil Action No. 21-CV-00813  
Defendant Deposition Testimony (December 14, 2022)  
Kevin Brown (Thompson Coe, Dallas, TX)
- 2023 James Bland, as Representative of Joshua Hall vs. A. Espinoza, et al  
Case No. CIV-21-664-R  
Plaintiff -Deposition Testimony (January 6, 2023)  
Mark Fassold (Watts Guerra, San Antonio, TX)

- 2023 J. Wilson vs. 3M Company, et al  
Case NO.: 22-CI-0812  
Defendant-Deposition Testimony (February 9, 2023)  
Byron Miller; Thompson, Miller & Simpson PLC (Louisville, Ky)
- 2023 E. Melendez vs. Sky Climber, LLC, 3M PROTECTA, et al  
Cause No: 2018-23719  
Defendant-Deposition (February 17, 2023)  
Gerald Alcazar; Norton Rose Fulbright (Minneapolis, Minnesota)
- 2023 T. Burgener, et al (Eight Plaintiffs) vs. Chevron/Syngenta Corporations  
“Paraquat Cases”  
Cause NO.: 3:21-pq-1218-NJR  
Defendant-Deposition Testimony (February 21, 2023)  
Tim Gray (Forman Watkins, New Orleans, LA)  
Kendra Marvel (Jones Day, Los Angeles, CA)  
Grace Brier (Kirkland & Ellis, Washington, D.C.)
- 2023 D. Hall vs. WITRON Integrated Logistics, et al  
Civil Action No. 4:21-CV-477  
Defendant-Deposition Testimony (May 4, 2023)  
Gordan Truong (Thompson Coe, Dallas, TX)
- 2023 J. Covington v. Clark Sand Co., et al  
Case No. 649,436  
Defendant-Deposition Testimony (August 11, 2023)  
Angela Beranek Brandt (Larson King, LLP, Thompson Coe, Dallas, TX)
- 2023 R. Rivera vs. Edwards Transportation, LLC, et al  
Cause No. 2022CVA000470D3  
Defendant-Deposition Testimony (August 18, 2023)  
Omar Saenz (Calvin, Saens, Rodriguez & Kennaner, LLP)
- 2023 A. Lager vs. National Carriers, Inc., et al  
Case No. 2021-CV-000010  
Plaintiff-Deposition Testimony (September 15, 2023)  
Jack T. Hyde/Melody Dickson (Wagstaff & Cartmell, LLP, Kansas City, MO)
- 2023 R. Teresko vs. 3M Company, et al  
Civil Action No. 22-cv-1532  
Defendant-Deposition Testimony (September 21, 2023)  
Gerardo Alcazar (Norton Rose Fullbright, US LLP, St. Paul, Minnesota)
- 2023 H. Bentley vs. BNSF Railway Company  
Cause No. 067-333618-22  
Plaintiff-Deposition Testimony (October 27, 2023)  
Judson Waltman (Lanier Law Firm, Houston TX)

- 2023 C. Looney, Jr. vs. AB& J Coal company, 3M, et al  
Claim Number: 2020-01477  
Defendant-Deposition Testimony (November 7, 2023)  
Angela Beranek Brandt (Larson King Law Firm, St. Paul, Minnesota)
- 2023 L. Scott on Behalf of A. Scott vs. Evans Delivery Company, Inc., et al  
Civil Action No. 22EV005672  
Plaintiff-Deposition Testimony (November 8, 2023)  
Mark A. Wade, Jr. (Georgia Auto Law, Atlanta, Georgia)

**Dennis J. Seal, Ph.D., P.E.**  
**Major Reports, Publications and Presentations**

**Note:** Publications following 2010 have not been released for public review  
due to security classifications

1. "Test Procedure: Ground Static Test Procedure for the Project 496 Program" in support of Navy EP-3E Modification, Contract No. 06-G-1471, June 2010 (L-3 Integrated Systems, Waco, Texas)
2. System Safety and Failure Analysis-Fuel System (FAR 25.981) in Support of the Supplemental Type Certificate for the AMNET Boeing Business Jet (BBJ) Program, Contract No. 09-L3-1150, Mar 2010
3. "Test Plan/Procedure for the Environmental Qualification Test of the P496 AP12 Series of Infrared Sensor System, Contract No. 06-G-1471, May 2009 (Environmental Test Laboratories, Dallas, Tx)
4. System Safety Analysis-Fuel System (FAR 25.981) in Support of the Supplemental Type Certificate for the AMNET Boeing Business Jet (BBJ) Program, Contract No. 09-L3-1150, March 2010
5. "Phase One Flight Test Plan for the Stratospheric Observatory for Infrared Astronomy (SOFIA) Program" Rev. B, NASA Contract No: USRA-8500-02, May, 2008
6. "System Safety Assessment Report" for the Stratospheric Observatory for Infrared Astronomy (SOFIA), NASA Contract No: NND06PSO2C, April, 2007
7. "SOFIA Flight Readiness Review" Safety Mission Assurance & Quality Assurance; Flight Test Hazards and Safety Assessment, NASA Contract No. NND06PSO2C, presented to NASA Safety Review Board, February, 2007
8. "Human Factors Engineering Evaluation" For The AFSOC MC-130E SPS Towed Decoy; Aircraft Modification Program, Prepared for the Boeing Company, Contract No: F33657-98-D-0002-RJ12, January, 2004
9. "Hazard Analysis and Control Report For The Airbus A340 Widebody Integrated Platform Protection System (WIPPS)," Contract No: 02-WIPPS-005, December, 2003
10. "Human Engineering Test Report For The Army Airborne Command And Control System (A2C2S)," Prepared for Raytheon Company, contract No: DAAH01-01-C-0139, August, 2003
11. "Acoustic Test Procedure For The Army Airborne Command And Control system (A2C2S)," Prepared For The Raytheon Company, Contract No: DAAJ01-01-C-0139, June, 2003
12. "System Safety Assessment For The Department of Homeland Security, Counter-Manpads" System Development and Demonstration Program (SDD), Test Phase 1 For The Commercial Airliner Protection System (CAPS), Prepared for AVISYS, Inc., May, 2003
13. "Night Vision Imaging System (NVIS) Test Procedure For The Army Airborne Command And Control System (A2C2S)for the UH-60L Black Hawk Helicopter," Prepared For The Raytheon Company, Contract No: DAAH01-01-C- 0139, April, 2003
14. "Hazardous Material Management Program For The Army Airborne Command And Control System (A2C2S)," UH-60L Helicopter, Prepared For The Raytheon Company, April, 2003



**Dennis J. Seal, Ph.D., P.E.**  
**Major Reports, Publications and Presentations**

15. "System Safety Hazard Analysis Report For The Army Airborne Command And Control System," UH-60L Helicopter, Contract No: DAAH01-01-C-0139, February, 2003
16. "Human Factors Engineering Design Approach Document-Operator," Human Factors Description For The Army Airborne Command and Control System (A2C2S), Prepared For The Raytheon Company, Contract No: DAAH01-01-C-0139, December 2001
17. "System Safety Analysis for IFE Manual Load Shed System" for Model B747 (400) VIP Aircraft; Failure Modes and Effects Analysis (FMEA), Drawing No. 91010129-000, Raytheon Systems Company, July, 2002
18. "Safety Assessment Report: White Sands Missile Range Frequency Surveillance System (WSMR-FSS) prepared for Naval Air Warfare Center Training Systems Division, Contract No. N61339-97-C-0030, June, 1999, author
19. "Command and Control Switching System: Failure Analysis and Tracking Report," prepared for Department of Air Force, Contract No. F04606-96-D-0074, April 1998, co-author
20. "The Human Factor in Computer Workstation Design," presented to the Society of Automotive Engineers (SAE), 1997 SAE Reliability, Maintainability, Supportability and Logistics Annual Conference and Workshop, (Distinguished Presentation Award), Dallas, Texas, June 23-25, 1997
21. "Human Machine Interface Analysis Document," Portuguese Air Traffic Control System, Contract No. L-SE 000104, prepared for Hughes Information Systems Company, April 1997, co-author
22. "Hazard Analysis Report: Swept Frequency Interferometric Radiometer (SFIR) Upgrade Upgrade System; Electrical, Chemical, Thermal, Environmental and Structural Analysis," Sacramento Air Logistics Center, Weather Division, December 1996, author
23. "Safety Assessment Report for the Secure Digital Switch System," Department of the Air Force, Offices of the Pentagon, Contract No. F04606-92-D-0549, October 1996, author
24. "Human Engineering Design Factors of Operator Workstations and Software Configuration for Caribbean Regional Communications Systems," Department of Air Systems Naval Command, Contract No. N0019-91-C-0086, July 1995, author
25. "Human Engineering, Ergonomic and Safety Report," Special Operation Forces Intelligence Vehicle (SOF-IV), U.S. Special Operations Command, Contract No. MDA 91 1-95-D-003, May 1995
26. "System Safety and Health Analysis for Super High Frequency (51ff) Communications Set," Production Program, ECP E-0274-015-R1, prepared for Space and Naval Warfare Systems Command Office, Washington D.C., May 1995, author
27. "Acoustical Noise Levels - Test Procedure and Safety Analysis," Quickfix and Advanced Quickfix EH-60L Helicopter, Contract No 96-086-NASOO1, January 1995. author
28. "System Safety and Personnel Health: Prohibitive Materials Report," Traveling Wave Tube Power Amplifier in Support of Super High Frequency (SHF) Satellite Communication (SATCOM) System, Contract No. N00039-89-C-0274, May 1994, author
29. "ERGONOMICS: Optimizing the Workstation While Eliminating Causal Factors of Repetitive Stress Injuries," presented to the Richardson Chamber of Commerce, Richardson, Texas, January 1994



**Dennis J. Seal, Ph.D., P.E.**  
**Major Reports, Publications and Presentations**

30. "Audio Noise Analysis for Ground-Based Sensor Vehicle System: Pre and Post Analysis Using Active Noise Reduction (ANR) Headsets," conducted for the Department of the Army, Electronic and Signals Processing Department, November 1993, author
31. "Systems Operations Analysis and Software Development: A Human Factors Approach," User Operating Systems Intelligence Common Sensor Tracking Systems, Contract No. DAABIO-91-C-0202. June 1993, co-author
32. "Ergonomic Task Analysis and Safety Factors Relevant to the Design of Crew Chief Operator Seat in a Mobile Ground Vehicle: Design and Application, Documented Report presented to the Department of Defense, Drawing No. CS 176549, May 1993, author
33. "Human Engineering Program Plan for Intelligence Electronic Common Sensor Systems," Contract No. DAABIO-91-C-0202, April 1993, author
34. "Operational Safety and Health Analysis Report," Solar Electro-Optical Network Program, Contract No. F04606-91-C-0038, February 1992, author
35. "Ergonomic Analysis and Design Approach - Maintainer," Low Frequency Transmitting and Antenna Matching Subsystem, Department of Navy, Iceland Installation, Contract No. N00039-89-C-02 17, October, 1991
36. "System Safety Program Analysis for Communication Transmitter Subsystem," Department of Navy, Space and Naval Systems Command, Washington, D.C. October 1989, author
37. "Operator Task Analysis and User Interface Developments: Mission Software, MMJ Symbolology, Controls and Displays, Workstation Design," Cruise Missile Mission Control Aircraft (CCMCA), Department of the Air Force. Aeronautical Systems, Contract No. F33657-88-C-0122, December 1988, author
38. "Applications of Symbolology and Linguistical Content for Product Safety Signs and Warning Labels," American National Standards Institute (ANSI Z 535.1 — - Z 535.5), Draft Publication 1985; Adopted Distribution, June 1991, Committee Member
39. "Residential Safety and Health Analysis: Termiticide Abatement Program: Design and Application of Safety Labels and Warnings," Dallas, Texas, Consultant, April 1987
40. "Man-Machine Interface Elements and Workstation Configurations for Consolidated Space Operations and Control Stations," NASA Program, Contract No. SSS-CSOC-00004C February 1986, author
41. "The Software Employee: A Case Study," Journal of Office Ergonomics, September/October, Volume 2, Number 5; 1985, author
42. "Comfortable Driving Speed Evaluated," Proceedings of the 27<sup>th</sup> Human Factors Society Annual Meeting, Norfolk, Virginia, October 10-14, 1983, author (Presentation based on author's published dissertation, 1980)
43. "A Study of Control Design and Video Game Performance," Proceedings of the Human Factors Annual Meeting, Norfolk, Virginia, October 10-14, 1983, author
44. "Optimizing the Working Environment of the Software Employee," A Case Study, Proceedings of the 26<sup>th</sup> Human Factors Society Annual Meeting, Seattle, Washington, October 25-29, 1982, author

**Dennis J. Seal, Ph.D., P.E.**  
**Major Reports, Publications and Presentations**

45. "Industrial Truck Safety Symbols: Conspicuity and Operator Response Times," Design Application and Graphical Format, Baker-Material Handling Corporation, August 1982, consultant/author
46. "An Analysis of Computer Based Office Design for Software Employees," Proceedings of the 13<sup>th</sup> Environmental Design Research Association Annual Meeting. University of Maryland; College Park, Maryland, May 1982, author
47. "Research Based Product Design: Human Factors Case Studies," presented to the Human Factors Society, New York Chapter; Freehold, New Jersey, February, 1982
48. "Corporate Standardization of Safety Labels for Industrial and Agricultural Machinery," Corporate Standards developed for John Deere and Co. , Moline, Ill. Sept 1981, coordinator of research/author
49. "Human Factors Engineering: Current State of the Art," presented to American Telephone and Telegraph (AT&T), Long Lines; Stamford, Connecticut, May, 1981, invited speaker
50. "Behavioral Applications in Product Design Based on Human Engineering Principles," presented to Harding University, Department of Psychology; Searcy, Arkansas, April, 1981, invited speaker
51. "The Interaction of Human Factors and Industrial Design at Henry Dreyfuss Associates." presented to Industrial Designers Society of America, New York City Chapter; Rockefeller Center, New York, New York, January 20~, 1981, invited speaker
52. "The Human Factor in Farm and Industrial Equipment Design," presented to American Society of Agricultural Engineers (ASAE); Distinguished Lecture Series, John Deere and Company, Moline, Illinois, December, 1980 co-author
53. "Human Factors and Industrial Design," presented to Long Beach State University, Department of Industrial Design; Long Beach, California, October, 1980, invited speaker
54. "Materials Manufacturing and Human Factors in Engineering and Product Design," presented at the AMF Annual Meeting; Trabuco Canyon, California, October 4-8, 1980, invited speaker
55. "Mediational Processes in Educable Mental Retards: Implications for Learning," Reported in N.R. Ellis (ed.), International Review of Research in Mental Retardation, Vol. 9, pp. 6 1-84; New York Academic Press, 1978, co-author
56. "A Reevaluation of Comfortable Driving Speeds," Consultant to the Office of Traffic Safety, Texas Department of Highways and Public Transportation, Austin, Texas 1977-1979, Director of Research/author
57. "Real-Time Information Displays," Department of Transportation: Studies for determining effectiveness of information content of highway signs on urban freeways and alternative routes; 1977-1978; Research Assistant
58. "The Linguistical and Imaginal Characteristics of Paired-Associative Learning Tasks as a Function of Subject-Generated Mediators," published Masters Thesis, Texas A&M University, College Station, Texas; funded by Health, Education and Welfare Department (H.E.W.); May, 1974, author

**Dennis J. Seal, Ph.D., P.E.**  
**Major Reports, Publications and Presentations**

59. "Project F.A.S.T. (Facilitating Academic Study Techniques) for Handicapped Children," Research Grants were funded by U.S. Office of Education for the investigation of learning tools (e.g. paired-associated mediators) for facilitating word recognition, reading ability, and comprehension scores. Principal Investigator: Dr. Clessen J. Martin, Department of Psychology, Texas A&M University, 1972-1974, Research Assistant
60. "Learning Theory, Memory and the Use of Visual Imagery," Principal Investigator: Dr. R.J. Senter, Department of Psychology, University of Cincinnati; conducted studies testing effectiveness of visual imagery on learning and recall (short-term and long-term effects), 1970-1972, Research Assistant